

Complex functions for Engineering Students

Homework 2

Exercise 1:

Let the complex numbers $z_1 := \frac{5 - i\sqrt{3}}{1 - i\sqrt{3}} - 1$ and $z_2 := -1 + i$ be given.

- Determine real and imaginary part of z_1 and the polar representation of z_1 and z_2 .
- Compute z_2^{12} .
- Provide all solutions of the equation $(w - z_2)^4 = -64$ in Cartesian coordinates.

Exercise 2:

For a function $f : D \rightarrow \mathbb{C}$ with $D \subset \mathbb{C}$ open and $z_0 \in D$, prove the following equivalence:

$$f \text{ is continuous in } z_0 \iff \operatorname{Re}(f), \operatorname{Im}(f) : D \rightarrow \mathbb{R} \text{ are continuous in } z_0 .$$

Hand in until: 21.4.